

No.

Date

Assume $\sqrt{2}$ is rational.

In reductio ad absurdum - try to prove it is

Assume $\sqrt{2} = \frac{a}{b}$ $\leftarrow \frac{a}{b}$ is a fraction in its lowest terms

Can't be simplified any more.

$$2 = \frac{a^2}{b^2}$$

$$\sqrt{2b^2} = a$$

Square both sides

$$2b^2 = a^2 \quad (a^2 \text{ must be an even number because } 2 \times)$$

$$\Rightarrow 2b^2 = a^2 \Rightarrow a^2 \text{ is even} \Rightarrow a \text{ is even}$$

$$\Rightarrow a \text{ is even} \Rightarrow a \text{ can be}$$

written as

$$a = 2m$$

any other number